



National Transportation Safety Board Aviation Accident Final Report

Location:	Opal, SD	Accident Number:	CEN17FA132
Date & Time:	03/16/2017, 1640 MDT	Registration:	N9581X
Aircraft:	CESSNA 210B	Aircraft Damage:	Destroyed
Defining Event:	Loss of control in flight	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The pilot was making a personal cross-country flight to return the airplane to the airport where it was normally stored after the completion of an annual inspection. The route of flight passed near a grass airstrip that was adjacent to the pilot's ranch home, and the wreckage was located about 275 yards from the northwest end of the airstrip. No witnesses to the accident were identified, and it could not be determined whether the pilot was performing a low pass or had attempted a landing at the airstrip.

Examination of the accident site indicated that the airplane impacted terrain in a nose-low attitude. Postaccident examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures.

Although the reported wind at an airport about 19 miles from the accident site was from 360° at 16 knots, the wind at an airport 53 miles from the accident site was from 320° at 34 knots with gusts to 40 knots. Additionally, weather modeling identified the potential for moderate low-level wind shear (LLWS) and moderate clear air turbulence within about 100 ft of the ground, and the potential for light LLWS from 100 to 500 ft above the ground. Therefore, it is possible that the airplane encountered LLWS and turbulence that contributed to a loss of control. Further, the pilot had severe coronary artery disease, which placed him at increased risk of a cardiovascular event that may have resulted in impairment or incapacitation. The investigation was not able to determine if adverse weather conditions or an acute cardiac event contributed to the accident.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot's loss of airplane control for reasons that could not be determined due to a lack of evidence.

Findings

Personnel issues	Cardiovascular - Pilot
Environmental issues	Windshear - Effect on operation
Not determined	Not determined - Unknown/Not determined (Cause)

Factual Information

History of Flight

Unknown	Loss of control in flight (Defining event)
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On March 16, 2017, about 1640 mountain daylight time, a Cessna 210B airplane, N9581X, impacted terrain near Vig Limousin Ranch Airstrip (1SD4), Opal, South Dakota. The commercial pilot was fatally injured, and the airplane was destroyed. The airplane was registered to Groves Vig & Vig LLP and was being operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91. Day visual meteorological conditions prevailed, and no flight plan was filed for the personal cross-country flight. The airplane departed from Rapid City Regional Airport (RAP), Rapid City, South Dakota, at 1606, and the destination was Faith Municipal Airport (D07), Faith, South Dakota.

The purpose of the flight was to return the airplane to D07, where it was normally stored, following its annual inspection at RAP. The route of flight from D07 to RAP passed near 1SD4, which was adjacent to the pilot's ranch home. The wreckage was located about 275 yards from the departure end of runway 31 at 1SD4. No witnesses to the accident were identified.

Pilot Information

Certificate:	Commercial	Age:	67, Male
Airplane Rating(s):	Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Lap Only
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	05/20/2015
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	3950 hours (Total, all aircraft), 1350 hours (Total, this make and model)		

The pilot, age 67, held a commercial pilot certificate with airplane single-engine land and instrument airplane ratings. On May 20, 2015, the pilot was issued a second-class medical certificate with a limitation to wear corrective lenses. At the time of the medical examination, the pilot reported having 3,300 hours of total flight experience of which 25 hours were in the last 6 months. The pilot reported no recent health care visits, no significant medical conditions, and no medication use, and the physical examination did not identify any significant medical issues.

On an insurance application dated November 1, 2016, the pilot report having 3,950 hours of total flight experience of which 1,350 hours were in the accident airplane make and model. Pilot logbooks were not available for review during the investigation.

Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N9581X
Model/Series:	210B	Aircraft Category:	Airplane
Year of Manufacture:	1961	Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	21057881
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	03/01/2017, Annual	Certified Max Gross Wt.:	2998 lbs
Time Since Last Inspection:	1 Hours	Engines:	1 Reciprocating
Airframe Total Time:	5002 Hours as of last inspection	Engine Manufacturer:	CONT MOTOR
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-470 SERIES
Registered Owner:	On file	Rated Power:	260 hp
Operator:	On file	Operating Certificate(s) Held:	None

The airplane was equipped with a Continental IO-470S engine, serial number 102046-1-5, and a 2-blade, constant-speed McCauley propeller. The last annual inspection was completed on March 1, 2017, at 5,002 total airframe hours and 932 hours since the last engine overhaul.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KRAP, 3168 ft msl	Distance from Accident Site:	57 Nautical Miles
Observation Time:	1652 MDT	Direction from Accident Site:	209°
Lowest Cloud Condition:		Visibility	10 Miles
Lowest Ceiling:	Broken / 11000 ft agl	Visibility (RVR):	
Wind Speed/Gusts:	32 knots / 39 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	330°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.82 inches Hg	Temperature/Dew Point:	18° C / 2° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	RAPID CITY, SD (RAP)	Type of Flight Plan Filed:	None
Destination:	Faith, SD (D07)	Type of Clearance:	None
Departure Time:	1630 MDT	Type of Airspace:	Class G

An automated weather observing system (AWOS) was located at D07, about 19 miles northeast of the accident location. At 1656, D07 reported the following conditions: wind 360° at 16 knots, temperature 16°C, dew point 7°C, and altimeter setting of 29.79 inches of mercury. At 1756, D07 reported wind 350° at 4 knots, temperature 12°C, dew point 7°C, and altimeter setting of 29.83 inches of mercury.

At 1649, a weather station located at Ellsworth Air Force Base, Rapid City, South Dakota, about 53 miles southwest of the accident location, reported the following conditions: wind 320° at 34 knots with gusts to 40 knots, visibility 10 statute miles or greater, light drizzle, ceiling broken at 11,000 ft above ground level (agl), temperature 18°C, dew point 2°C, and altimeter setting of 29.82 inches of mercury.

At 1700, high-resolution rapid refresh model soundings for the accident location indicated that the wind near the surface was from the northwest at 14 knots. Modeling identified the potential for moderate low-level wind shear (LLWS) and moderate clear air turbulence within about 100 ft of the surface and the potential for light LLWS between about 100 ft agl and about 500 ft agl.

A review of weather radar imagery revealed very light reflectivity targets moving through the accident area. There were no publicly disseminated pilot reports from South Dakota within an hour of the accident time.

Airport Information

Airport:	Vig Limousin (1SD4)	Runway Surface Type:	Grass/turf
Airport Elevation:	2558 ft	Runway Surface Condition:	
Runway Used:	31	IFR Approach:	None
Runway Length/Width:	2200 ft / 50 ft	VFR Approach/Landing:	Unknown

1SD4, located 4 miles south of Opal, is a private, nontowered airport. The airport is at an elevation of 2,558 ft mean sea level and has a 2,200-ft-long by 50-ft-wide turf runway designated as runway 13/31. The airport is surrounded by open grasslands and fields with rolling hills.

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	44.874167, -102.416667 (est)

The accident site was in a ranching area with rolling hills. The initial impact point was about 275 yards beyond the departure end of runway 31 and slightly right of the extended runway centerline. The debris path was about 175 ft long on a heading of 020°. The initial impact point included ground scars consistent with the right-wing tip and propeller, and there was no evidence that the airplane struck obstacles before ground impact.

The airplane came to rest upright with both wings separated from the fuselage. Both wing fuel tanks were compromised and empty. The landing gear and flaps were found in the up positions.

Flight control continuity was established from the rudder, elevator, and elevator trim tab to the forward floor assembly. Aileron continuity was established with left and right aileron cables separated in tensile overload.

The propeller came to rest between the initial impact point and the airframe wreckage. Both propeller blades exhibited scoring and leading-edge damage. One blade had a 90° rearward twisting bend starting about 18 inches outboard of the blade shank. The second blade had a slight forward twisting bend starting about 20 inches outboard of the blade shank.

The engine was rotated manually, and normal mechanical continuity was confirmed with compression obtained on all six cylinders. The cylinder combustion chambers were examined

with a lighted borescope with no anomalies noted. The spark plug electrodes exhibited normal signatures.

The mixture and throttle arms were secured to their respective shafts, and the throttle plate was in the fully closed position. The fuel inlet screen was uncontaminated, and fuel discharged from the metering unit when fuel hoses were removed. The fuel injectors were uncontaminated, and the fuel manifold was intact with a small amount of fuel present.

The exhaust system was impact damaged with both mufflers separated. Both flame cones were intact and in place, and both exhaust collectors remained attached to their respective cylinder exhaust ports. Examination of the airframe and engine revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Medical And Pathological Information

The Clinical Laboratory of the Black Hills, Rapid City, South Dakota, performed an autopsy on the pilot, and the documented cause of death was blunt trauma injuries. The right coronary artery showed up to 80% narrowing, and the left anterior descending and left circumflex coronary arteries each showed 40% to 50% narrowing. The heart muscle had a 2 x 1 x 1 centimeter area of fibrosis of the posterior left ventricle that was "grossly compatible with a remote myocardial infarct." Microscopic examination of the heart muscle confirmed fibrosis. The heart muscle changes were consistent with an old ischemic event causing muscle damage; however, no acute changes were identified.

The FAA Bioaeronautical Sciences Research Laboratory, Oklahoma City, Oklahoma, performed toxicology testing. No ethanol, carbon monoxide, or tested-for-drugs were identified.

Administrative Information

Investigator In Charge (IIC):	Michael J Folkerts	Report Date:	11/13/2018
Additional Participating Persons:	Brandon Caneva; Flight Standards District Office; Rapid City, SD Pete Basile; Textron Aviation; Wichita, KS Mike Council; Continental Motors; Mobile, AL		
Publish Date:	11/13/2018		
Note:	The NTSB traveled to the scene of this accident.		
Investigation Docket:	http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=94877		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).